S.3.4.7 Other Department of Energy/National Nuclear Security Administration Sites

Section S.3.2.2 describes the site screening process utilized to determine the reasonable site alternatives for the MPF EIS. As described in that section, all existing, major DOE sites were considered to serve as the host location for a MPF. A two-step screening process was employed: first, all potential sites were judged against "go/no go" criteria; and second, those sites satisfying the go/no go criteria were judged against desired, weighted criteria. Sites that did not satisfy the go/no go criteria, or which scored lowest against desired, weighted criteria were judged to be unreasonable site alternatives for a MPF.

S.3.4.8 Construct and Operate a Smaller Modern Pit Facility

As stated previously, the exact size and composition of the enduring stockpile is uncertain. Studies in the classified appendix have examined capacity requirements that would result from a wide range of enduring stockpile sizes and compositions, pit lifetimes, emergency production needs (referred to as "contingency" requirements), and facility full-production start dates. Although the precise future capacity requirements are not known with certainty, enough clarity has been obtained through these ongoing classified studies that the NNSA has identified a range of pit production capacity requirements (125-450 ppy) that form the basis of the capacity evaluations in this EIS. The EIS evaluates the impacts of a new MPF designed to produce three capacities: 125 ppy, 250 ppy, and 450 ppy. If there were significant further reductions in the nuclear weapons stockpile (beyond those already considered in the classified analyses), or if future technical studies demonstrate that pit lifetimes significantly exceed 45-60 years, then the need, capacity, and timing for a new MPF would need to be reassessed. With respect to these uncertainties, NNSA has chosen not to speculate beyond the assumptions described in this EIS. As such, this EIS does not propose to construct and operate a new MPF with a capacity smaller than 125 ppy. However, as described in Sections S.3.3.3, this EIS does evaluate a TA-55 Upgrade Alternative (80 ppy) as a "hedge" in the event of unforeseeable significant changes in stockpile size or pit lifetime.

S.4 PREFERRED ALTERNATIVE

The CEQ regulations require an agency to identify its preferred alternative to fulfill its statutory mission, if one or more exists in a draft EIS (40 CFR 1502.14 [e]). For this MPF Draft EIS, constructing and operating a new MPF is the preferred alternative based on considerations of environmental, economic, technical, and other factors. A preferred host site for the MPF has not yet been determined, but will be identified in the Final EIS, if the Secretary decides to proceed with a MPF.

S.5 COMPARISON OF ALTERNATIVES

S.5.1 Introduction

To aid the reader in understanding the differences among the various alternatives, this section presents a summary comparison of the potential environmental impacts associated with the alternatives in the MPF EIS. The comparisons concentrate on those resources with the greatest potential to be impacted.

The information in this section is a summary of the environmental impacts based on information presented in Chapter 5 of the EIS. Table S.5.1–1 at the end of this document provides quantitative information that supports the text below.

S.5.2 Environmental Impacts

Land Use

All action alternatives would result in land disturbance. As shown in Table S.5.1–1, the amount of land disturbed for all alternatives would be less than 2 percent of the available land area. However, there would be no impacts to land use plans or policies.

Visual Resources

All action alternatives except SRS would result in no changes to current Class IV BLM Visual Resource Management ratings. Although SRS does not have a BLM Visual Resource Management rating, constructing and operating a MPF would be consistent with the currently developed areas of SRS.

Site Infrastructure

SRS has adequate electrical energy capacity and peak load capability for all three proposed MPF sizes. LANL has adequate electrical energy and peak load capability for the TA-55 Upgrade Alternative (80 ppy). LANL would require additional peak load capability, and Pantex Site would require additional energy capacity for the 450 ppy plant. Carlsbad Site would require additional peak load capability for all three sized plants and additional energy capacity for the 450 ppy plant. NTS would require additional energy capacity and peak load capability for all three sized plants.

Pantex Site, SRS, and the TA-55 Upgrade Alternative (80 ppy) at LANL have adequate process steam available to support all MPF size plants. The Carlsbad Site would require extension of a local gas pipeline and NTS would require the construction of a pipeline or a rail line to supply fuel for the process steam plant required for any of three production capacity options.

Air Quality

All action alternatives would result in air quality levels that would be in attainment with the NAAQS for all criteria pollutants. However, surge operations of the 450 ppy plant at LANL would exceed the 24-hour nitrogen dioxide standard by approximately 5 percent. If the 450 ppy plant is built at LANL, mitigation measures would be designed and implemented to bring these emissions into compliance. All sites are in attainment areas. A PSD analysis would be done in the site-specific tiered EIS.

Water Resources

The water requirements for the construction of all action alternatives would be within existing site water allotments. The existing site water allotment at NTS, Pantex Site, and SRS would be adequate to support the operation of all three plant sizes. Although the current water allotment at

LANL would support the TA-55 Upgrade Alternative (80 ppy) and 125 ppy options, LANL would need to expand its water allotment for the 250 ppy and 450 ppy plant by purchasing more water. Carlsbad Site would need to purchase more water to expand its water allotment for the operation of all three plant sizes. Sufficient capacity exists for both LANL and Carlsbad Site to purchase additional water to support MPF operations.

Biological Resources

For all action alternatives, some habitats unique to each area would be modified or lost and there could be a decrease in quality of the habitat adjacent to the proposed development. It is not expected that any wetlands would be impacted by any alternative. There are no designated critical habitats for any listed threatened or endangered species at any of the site alternatives, and thus no impacts are expected.

Cultural and Paleontological Resources

Any ground disturbance has the potential to impact cultural and paleontological resources at any of the alternative sites. At the programmatic level, there are no significant differences between the alternative sites with respect to potential impacts to cultural and paleontological resources. Prior to any ground-disturbing activity, NNSA would identify and evaluate any cultural and paleontological resources that could potentially be impacted by the construction of a MPF or upgrade to the TA-55 Facility. If necessary, NNSA would implement appropriate measures to avoid, reduce, or mitigate any impacts.

Socioeconomics

New jobs would be created for all action alternatives. For the MPF alternatives, the number of direct jobs created during the peak year of construction would range from approximately 770-1,100, depending upon the capacity constructed. The number of indirect jobs created would vary depending upon the site. Table S.5.1-1 displays an estimate of the total number of jobs (direct plus indirect) created during the peak year of construction for the various MPF site alternatives. The maximum population influx would not exceed 3 percent at any site.

During operations, the number of direct jobs created would range from approximately 990-1,800, depending upon the capacity of the MPF. As shown on Table S.5.1-1, the total number of jobs would range from 1,230-3,090, depending upon the capacity of the MPF. During operations, all sites except NTS and SRS would have an increase in population for all plant sizes. The population increases are shown on Table S.5.1-1. Due to the population increases, which would be less than 3 percent, there would be no impacts on community services, except at Carlsbad Site, where increases in some resources would be required to maintain comparable levels of community services.

The TA-55 Upgrade Alternative (80 ppy) would result in a maximum of 190 direct jobs during the peak year of construction and 660 direct jobs during operations. Table S.5.1-1 displays the total number of jobs (direct plus indirect) associated with the TA-55 Upgrade Alternative.

Radiological Impacts

During normal MPF operations, radiological impacts to workers and the public would occur. Impacts to workers would be independent of the MPF site. At all MPF sites, the average individual dose to a worker would be 290 mrem/yr for the 125 ppy facility, 390 mrem/yr for the 250 ppy facility, and 510 mrem/yr for the 450 ppy facility. These doses would be below regulatory limits and limits imposed by DOE Orders. Statistically, for the average worker, a 290 mrem/yr dose translates into a risk of one fatal cancer every 8,620 years of operation; a 390 mrem/yr dose translates into a risk of one fatal cancer every 6,410 years of operation; a 510 mrem/yr dose translates into a risk of one fatal cancer every 4,900 years of operation.

For the TA-55 Upgrade Alternative, the average individual dose to a worker would be a 380 mrem/yr. Statistically, this translates into a risk of one fatal cancer every 6,580 years of operation.

Doses to the public would be site dependent. Sites with the smallest 80-km (50-mi) population would have the smallest impact. For example, the collective population dose to the population surrounding NTS and Carlsbad Site would be smaller than LANL, Pantex Site, and SRS due to the relative remoteness of NTS and Carlsbad Site. However, the collective population dose at any of the five sites is small in any event. The maximum collective population dose would occur at SRS for the 450 ppy facility. This dose would be 1.3×10^{-6} person-rem/yr, which statistically would translate into one fatal cancer risk every 1.5 billion years of operation. The TA-55 Upgrade Alternative would also be bounded by this population dose. At all sites, the maximally exposed offsite individual would receive a dose less than 1 mrem per year.

Nonradiological Impacts

Statistically, nonradiological occupational impacts to workers during the construction and operation of a MPF would be expected to result in less than one fatality. The impacts to workers are estimated to be the same for all action alternatives except the TA-55 Upgrade Alternative (80 ppy) which would have the smallest potential impact due to the least amount of construction activity.

Accidents

Radiological. Potential impacts from accidents were estimated using computer modeling. In the event of any accidents, the projected annual risk of latent cancer fatality (LCF) at all MPF sites for the surrounding population would be less than one. For the bounding accident analyzed in the EIS (explosion in a feed casting furnace), the highest potential annual risk to the population within 80-km (50-mi) would be an increase in LCFs of 0.125 at LANL from either the MPF or TA-55 Upgrade Alternative. Statistically, this would equate to one additional LCF among the 80-km (50-mi) population surrounding LANL every 8 years of operation and this accident would be expected to occur once every 100 years. For this accident, the dose to the maximally exposed offsite individual would be 38 rem, which exceeds DOE exposure guidelines. The analyses in these cases for NEPA purposes are based on unmitigated releases of radioactive material to select a site for the MPF. Following the ROD and selection of a site, additional NEPA action would be taken that would identify specific mitigating features that would be incorporated in the

MPF design to ensure compliance with DOE exposure guidelines. At NTS and Carlsbad Site, this risk would be smallest due to the relative remoteness of these two sites.

Nonradiological. The impacts associated with the potential release of the most hazardous chemicals used at a MPF were modeled to determine whether any impacts could exceed site boundaries. Based upon those modeling results, it was determined that no chemical impacts would exceed site boundaries at SRS and NTS. At LANL, Pantex Site, and Carlsbad Site, an accidental chemical release had the potential to cause impacts beyond site boundaries. In such an event, emergency preparedness procedures would be employed to minimize potential impacts.

Transportation

During normal transportation of radiological materials (plutonium, enriched uranium, TRU waste and LLW), radiological impacts to transportation workers and the public would occur. Impacts to workers and the public would be dependent on the MPF site and the population along expected transportation routes. All pits would originate and terminate at Pantex and all enriched uranium components would be transported to the MPF site from the Y-12 National Security Complex at Oak Ridge, Tennessee, and back. Two locations (Pantex Site and Carlsbad Site) would transport LLW offsite.

For all alternatives, the environmental impacts and potential risks of transportation would be small, e.g., less than one latent cancer fatality per year. As shown in Table S.3.5–1, the average collective dose to transportation workers from incident free transportation would be a maximum of 10.2 person-rem/yr for the 450 ppy facility. Statistically, a 10.2 person-rem/yr dose translates into a risk of one fatal cancer every 245 years of operation. The average collective dose to the general public from incident free transportation would be a maximum of 12 person-rem/yr for the 450 ppy facility. Statistically, a 12 person-rem/yr dose translates into a risk of one fatal cancer every 167 years of operation.

In the event of a transportation accident, the maximum average collective dose to the general public from a transportation accident would be 0.29 person-rem/yr for the 450 ppy facility. Statistically, a 0.29 person-rem/yr dose translates into a risk of one fatal cancer every 6,897 years of operation.

Waste Management

The amount of waste generated by the MPF would be the same at all sites. These values and those from the TA-55 Upgrade Alternative (80 ppy) are shown in Table S.5.1–1. The TRU waste from all sites would be transported to the Waste Isolation Pilot Plant or other similar type facility for disposal (the impact of this is included in the transportation section). All LLW at LANL and at NTS would be handled in existing onsite burial LLW disposal facilities. The existing aboveground E-Area retrievable vault storage facilities at SRS are not adequate and planned onsite disposal facilities would require additional capacity to handle the quantities of LLW generated by the MPF for the 250 ppy and 450 ppy facilities. Pantex Site and Carlsbad Site do not have any onsite LLW disposal facilities and would ship their MPF LLW to NTS. Pantex Site would need to expand its temporary LLW storage facility, and Carlsbad Site would need to construct a temporary LLW storage facility.